PRELIMINARY SERVICE MANUAL

ACT-T-K500

REGENCY ELECTRONICS, INC.
7707 Records Street
Indianapolis, Indiana
46226

8-80 0300-1212-700

K500 ALIGNMENT PROCEDURE

Equipment Required

FM Signal Generator
AC Voltmeter capable of reading 455 KHz
Frequency Counter
DC Voltmeter, preferably digital type

A. VCO Adjustment

1. Program 144 MHz (VCO = 133.655 MHz) into Channel 104. (It is not necessary to key in a decimal point or any zeros).

2. Program 470.9 MHz into Channel 103.

3. Program 470.8 MHz into Channel 102.

4. Program .512 MHz (VCO = 167.218 MHz) into Channel 101 and push Manual. (The leading decimal point removes the limits test and permits the proper entry of 512 MHz).

5. Note the voltage on the jumper adjacent to R206 (22K); it should be 9.1 to 9.6 VDC.

6. While still in Channel 101, measure the voltage on right end of R206 (end towards IC201).

7. Tune L201 until R206's voltage (as measured in Step 6) is 0.5 V BELOW the jumper's voltage measured in Step 5. (Approximately 8.6 to 9.1 VDC).

8. Push Channel 102 and measure the voltage on right end of R206; voltage should read 2.4 to 3.6.

9. Push Channel 103 and measure the voltage on right end of R206; voltage should read 6.0 to 8.0.

10. Push Channel 104 and measure the voltage on right end of R206; voltage should read 0.4 to 1.0 volts.

NOTE: Display of "Poor F." means that L201 is badly mistuned; Repeat Steps 4 through 7.

B. Receiver - Low Band

1. Program in 46 MHz into Channel 101.

2. With Signal Generator (no modulation) accurately set on frequency, tune L112 for MAXIMUM signal on Pin 5 of IC101. Reduce generator's output level as necessary to properly peak L112.

B. Receiver - Low Band Continued

3. Tune L102 and L103 (in that order) for MAXIMUM signal on Pin 5 of IC101. Reduce generator's output if necessary to properly peak these coils.

4. Very carefully tune L204 for MAXIMUM signal on Pin 5 of IC101.

5. Program in 157 MHz into Channel 1 and push Manual.

6. Accurately set Signal Generator to 157 MHz and set modulation to 3.5 KHz.

7. Tune L114 for MAXIMUM audio.

8. Program 35 MHz into Channel 102 and check DC voltage on right hand side of R102 (39K). It should read 0.5 to 0.9 volts.

C. Receiver - High Band

1. Program .512 MHz into Channel 102.

2. Program 440 MHz into Channel 103.

3. Program 470 MHz into Channel 101 and push Manual.

4. While still in Channel 101, adjust L110 for MINIMUM DC voltage on the emitter of Q108.

5. Step to Channels 102 and 103 and check Q108's emitter voltage; it should be within 0.1 V of the same final reading of Step 4.

6. Program 165 MHz into Channel 1.

7. Accurately set Signal Generator to 165 MHz, no modulation.

8. Tune L105 and L106 for MAXIMUM signal on Pin 5 of IC101.

9. Program 155 MHz into Channel 1.

10. Set Signal Generator to 155 MHz.

11. Adjust R170 and L107 for MAXIMUM signal on Pin 5 of IC101.

12. Check DC voltage on right hand side of R102 (39K). It should read 1.5 to 2.1 volts.

K500 ALIGNMENT PROCEDURE

D. Receiver - UHF Band

1. Program 492 MHz into Channel 1.

2. Set Signal Generator to 492 MHz.

3. Adjust C127, C132 and C148 (in that order) for MAXIMUM signal on Pin 5 of IC101. Repeat until no improvement is noted.

4. Program 460 MHz into Channel 1.

5. Set Signal Generator to 460 MHz.

6. Adjust R171 for MAXIMUM signal on Pin 5 of IC101.

E. Netting Adjustment

1. Program 162.345 MHz into Channel 1.

2. Adjust C416 (on logic bd.) for a frequency of 152.0000 MHz (±500 Hz) at Junction of coax and C141.

3. Connect counter to TP-1 on logic bd.

4. Adjust C409 to as close as possible to 3.579540; must be able to set it to within 10 Hz.

F. Tone Adjustment

In ANY Channel, programmed 162.00 MHz, set Signal Generator to 162 MHz, 3.5 KHz deviation.

a. Input level check @ C428 (Yellow wire)

1. 1050 Hz = .3 v peak or greater.

2. 2000 Hz - .28 v peak or greater.

b. Frequency Adjustment - 2000 Hz

1. Place scope probe on Pin 8 of IC414.

2. Peak R428 for maximum (greater than .4 v peak).

3. Vary audio input frequency plus and minus approximately 50 Hz to make sure peak is centered at 2000 Hz.

a). If not centered, shunt R431 with between an 18K to 10K resistor to obtain maximum output at 2000 Hz.

F. Tone Adjustment - Continued

4. Check deviation level at which tone mutes receiver.

   a). 2.5 KHz to 3.5 KHz.

G. Frequency Adjustment - 1050 Hz

1. Place scope probe on Pin 14 of IC414.

2. Peak R414 for maximum (greater than .4 v peak).

3. Vary audio input frequency plus and minus approximately 50 Hz to make sure peak is centered at 1050 Hz.

   a). If not centered, shunt R417 with between a 18K to 10K resistor to obtain maximum output at 1050 Hz.

4. Enter: WX Alert; CH2

5. Set Signal Generator to 162.4 MHz

6. Check deviation level at which tone "alerts" WX 2.

   a). 3.25 KHz to 4 KHz.

7. If tone "alerts" below 3.25 KHz deviation, increase R413 and if tone does not "alert" below 4 KHz deviation, decrease R413.

VOLTAGES

LOGIC BOARD

Voltages taken with digital voltmeter, receiver on Channel 101, no signal applied.

	E	B	C
Q401	0	0.7	.05
Q402	0	.05	4.9
Q403	0	0.7	.15
Q404	0	0.7	.05
Q405	0	.03	4.9
Q406	4.9	4.9	0
Q407	0	0	4.9
Q408	0	0.1	4.9
Q409	4.9	4.9	0
Q410	0	0	4.9
Q411	0	.02	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC401	2.0	1.5	1.7	5.8	0.7	4.8	4.8	2.8	1.5	1.5	0.7	0.7	1.2	1.5	1.2	4.7	4.7	4.7	4.7	0

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	0	0.1	0.1	0.1	4.9	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	4.9	0.1	0.2	0.2	3.6	4.9	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC402	4.9	0.1	4.8	4.9	0.1	4.8	0	4.8	0.1	4.7	4.8	0.1	4.9	4.9

	1	2	3	4	5	6	7	8
IC403	3.6	0	0	0	2.6	3.3	1.3	8.0

	1	2	3
IC404	17	0	8.0

LOGIC BOARD CONTINUED

	1	2	3	4	5	6	7	8
IC405	2.4	2.4	3.9	0	0	0.1	2.6	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC406	4.9	2.0	4.0	3.9	4.0	4.0	0.2	0	3.8	4.9	4.4	4.4	4.4	4.4	4.4	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC407	4.9	2.0	0.1	4.0	0.1	0.1	4.9	0	3.8	4.9	2.1	2.1	2.2	2.2	0.4	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC408	4.9	2.0	0.1	0.1	0.1	4.0	0.4	0	3.8	4.9	2.8	2.1	2.1	2.1	0.4	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC409	4.9	2.1	0.1	4.0	4.9	4.9	0.3	0	3.8	0.4	4.4	4.9	4.4	2.75	0.2	4.9

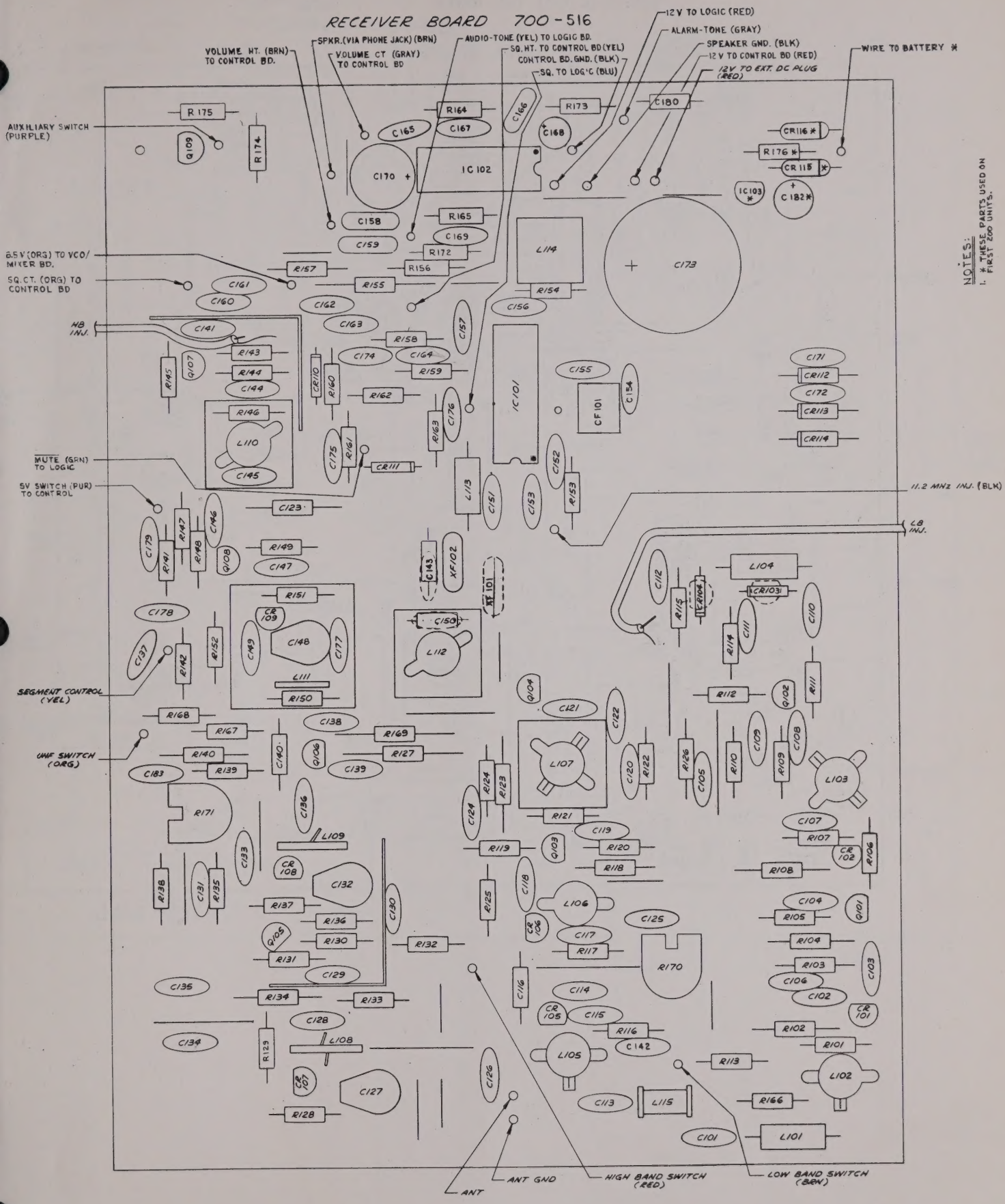
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC410	4.2	4.2	0.3	2.1	0.2	3.8	0	4.5	4.9	0.1	2.1	2.7	2.7	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC411	4.0	4.0	0.1	0.1	0.1	4.0	0	0.1	4.9	0.1	0.1	4.0	0.1	4.9

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC412	4.9	4.9	4.9	0.1	4.0	0.1	0	0.1	4.9	0.1	4.1	4.1	4.1	4.0

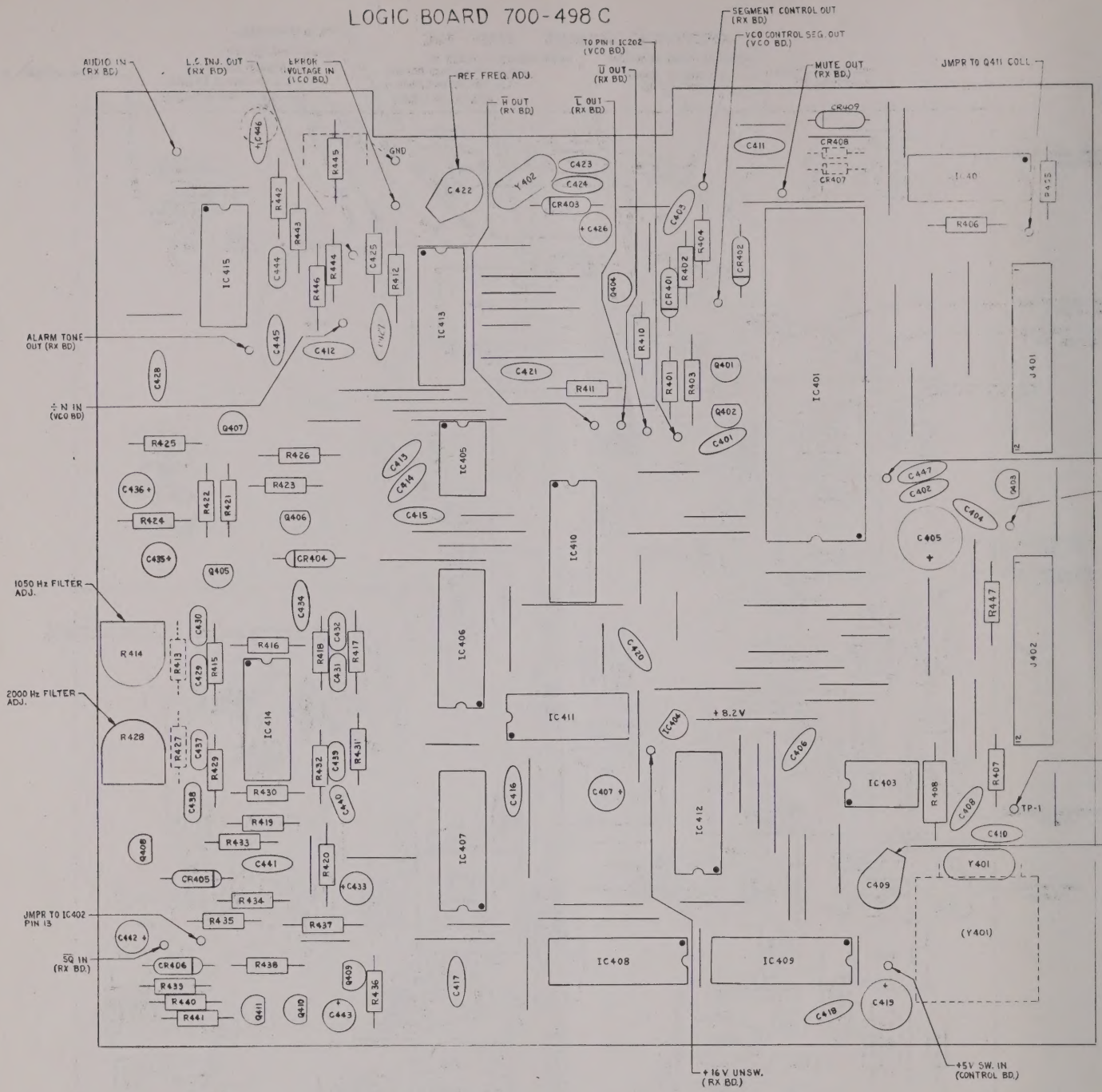
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC413	4.9	3.8	25	2.3	1.1	4.9	0	4.9	0	0	0	0	4.5	4.9	4.5	0

RECEIVER BOARD 700-516

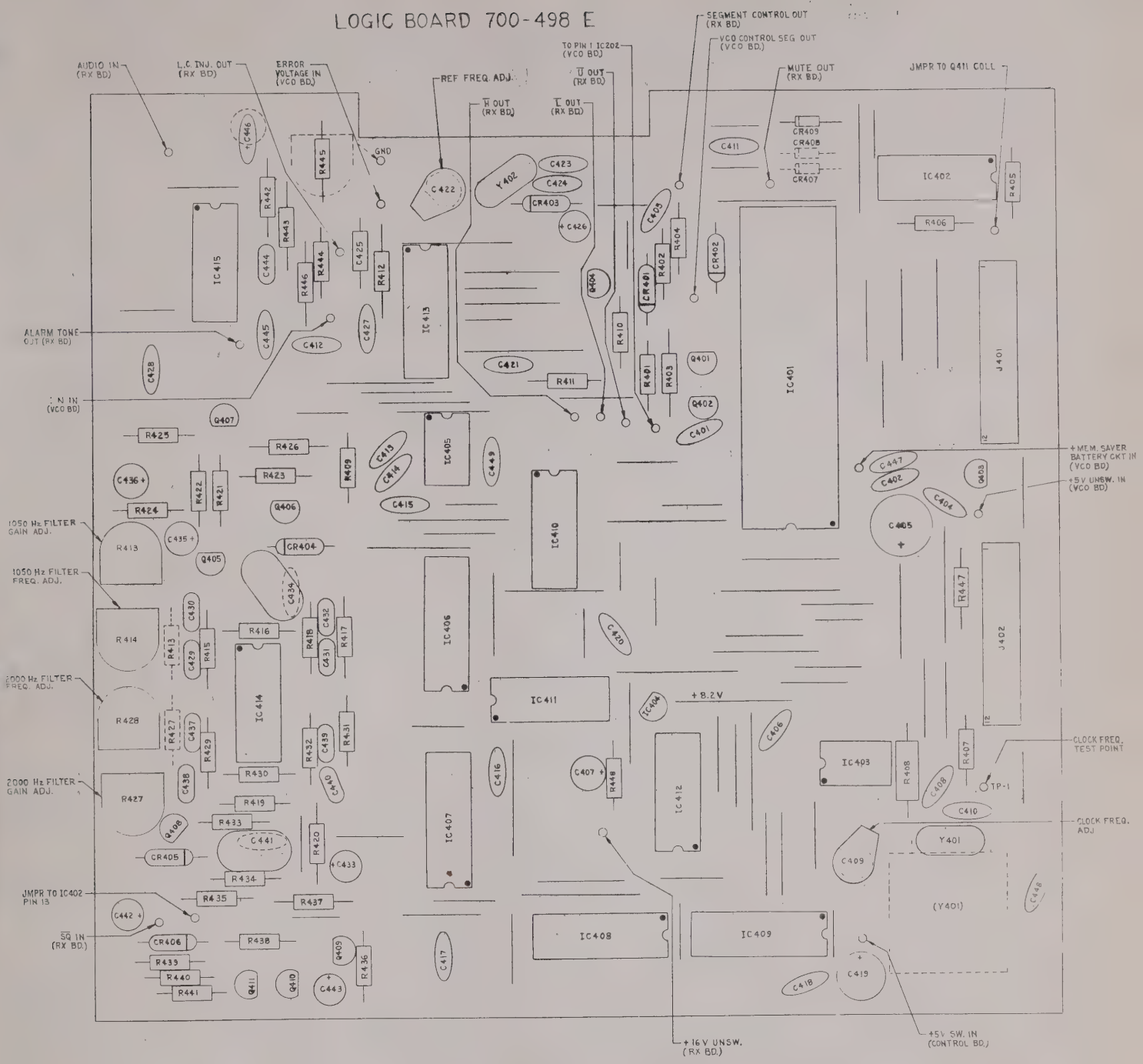


NOTES:
1. * THESE PARTS USED ON FIRST 200 UNITS.

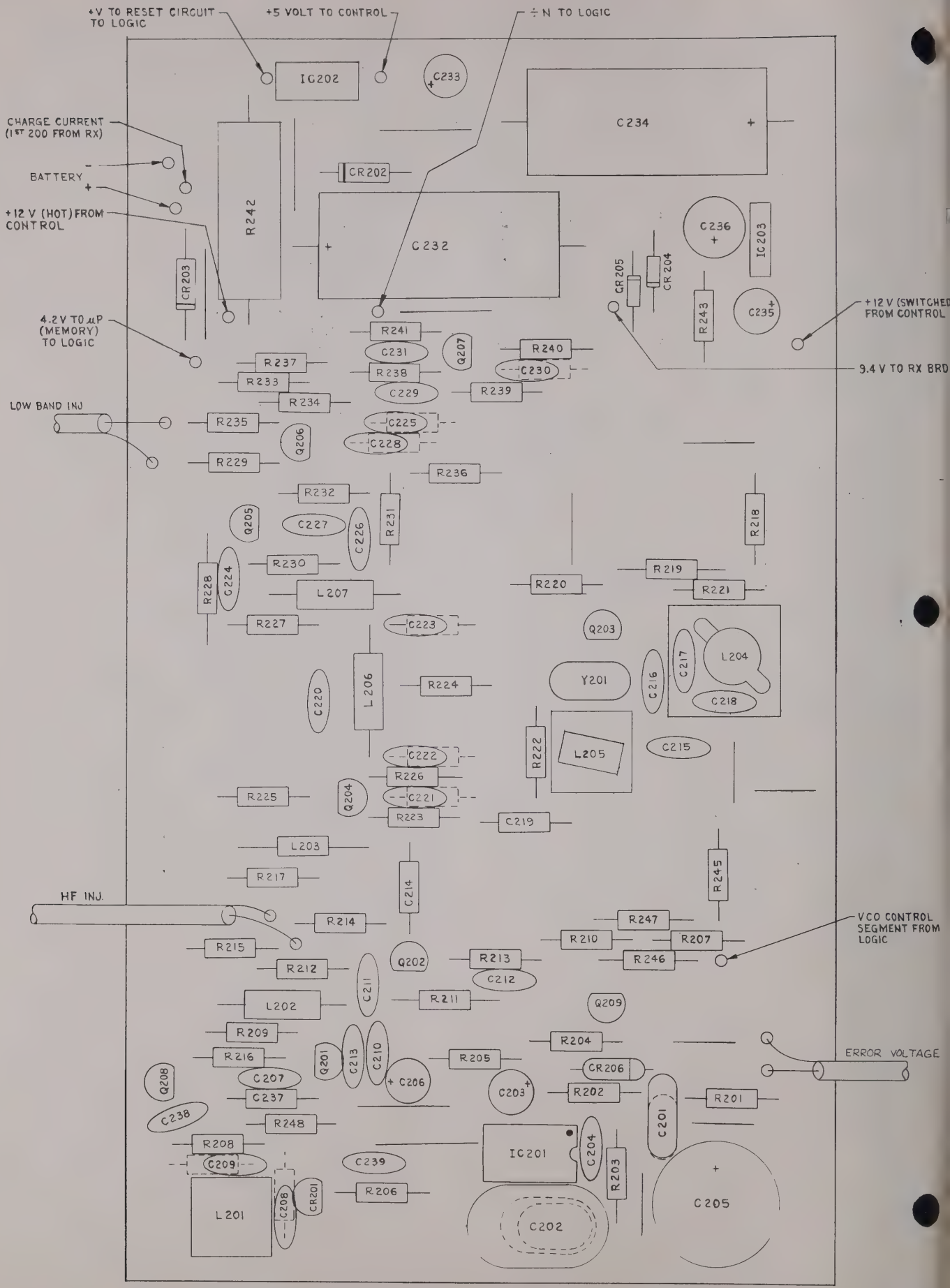
LOGIC BOARD 700-498 C



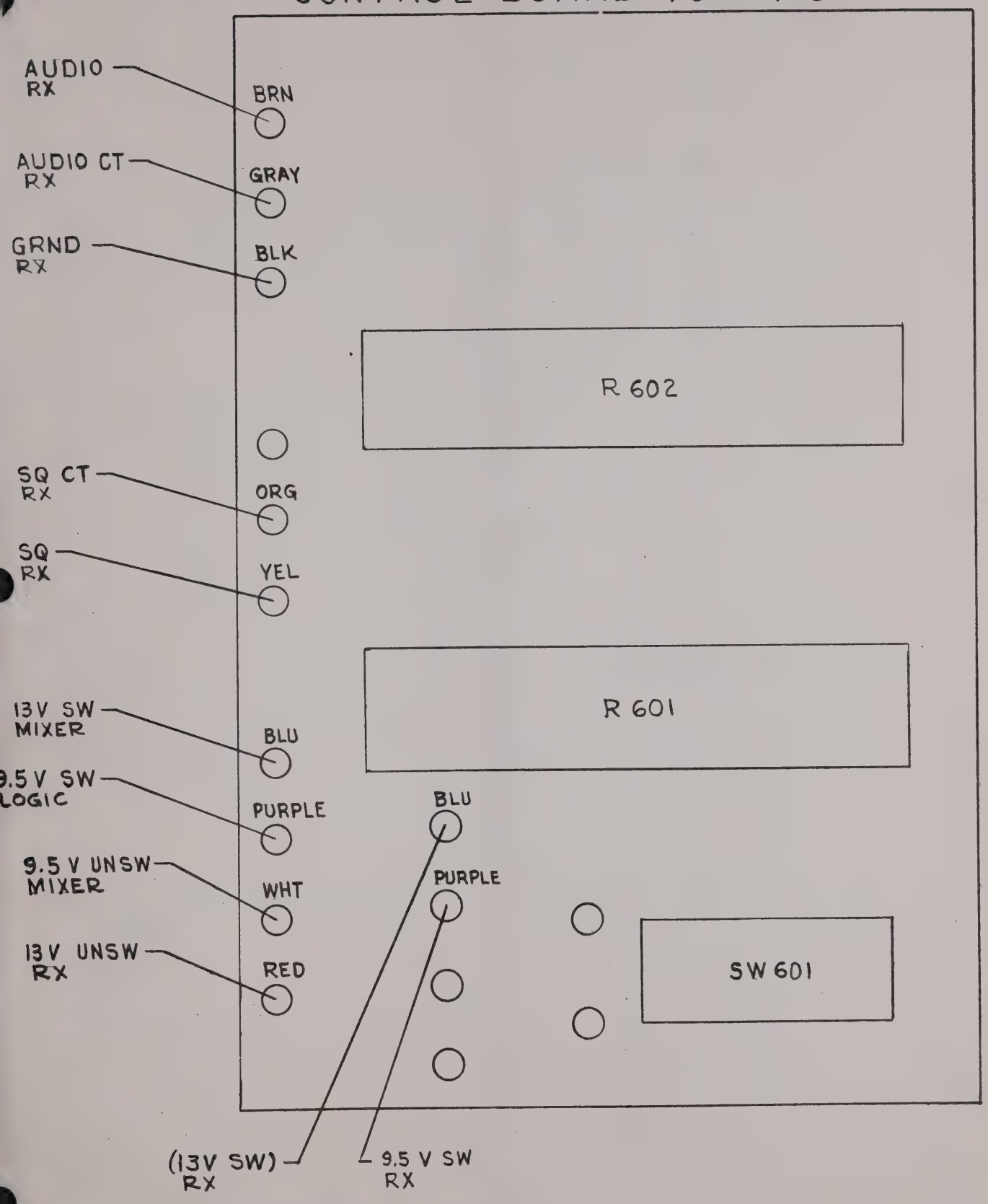
LOGIC BOARD 700-498 E



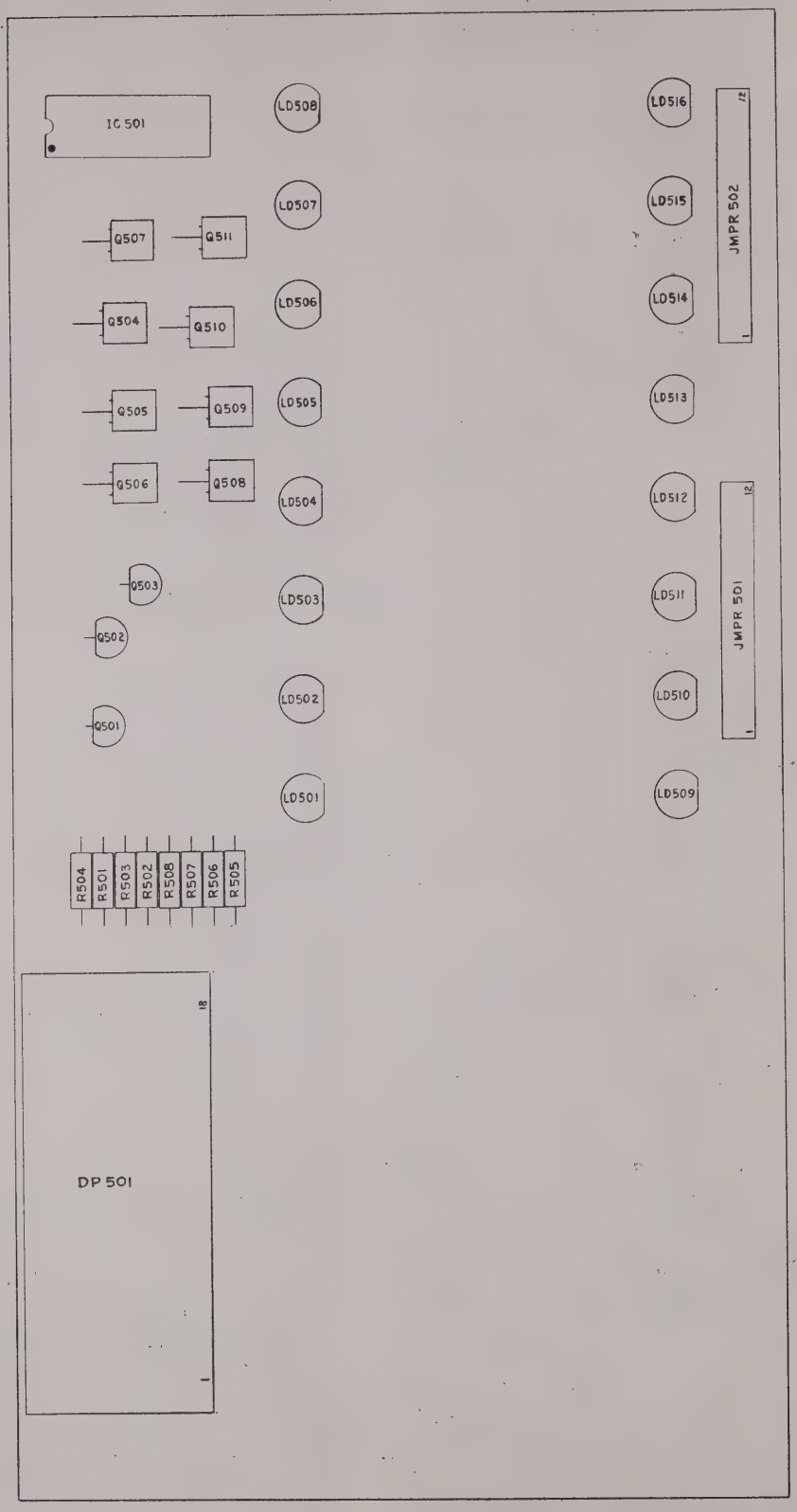
MIXER VCO BD 700-539C

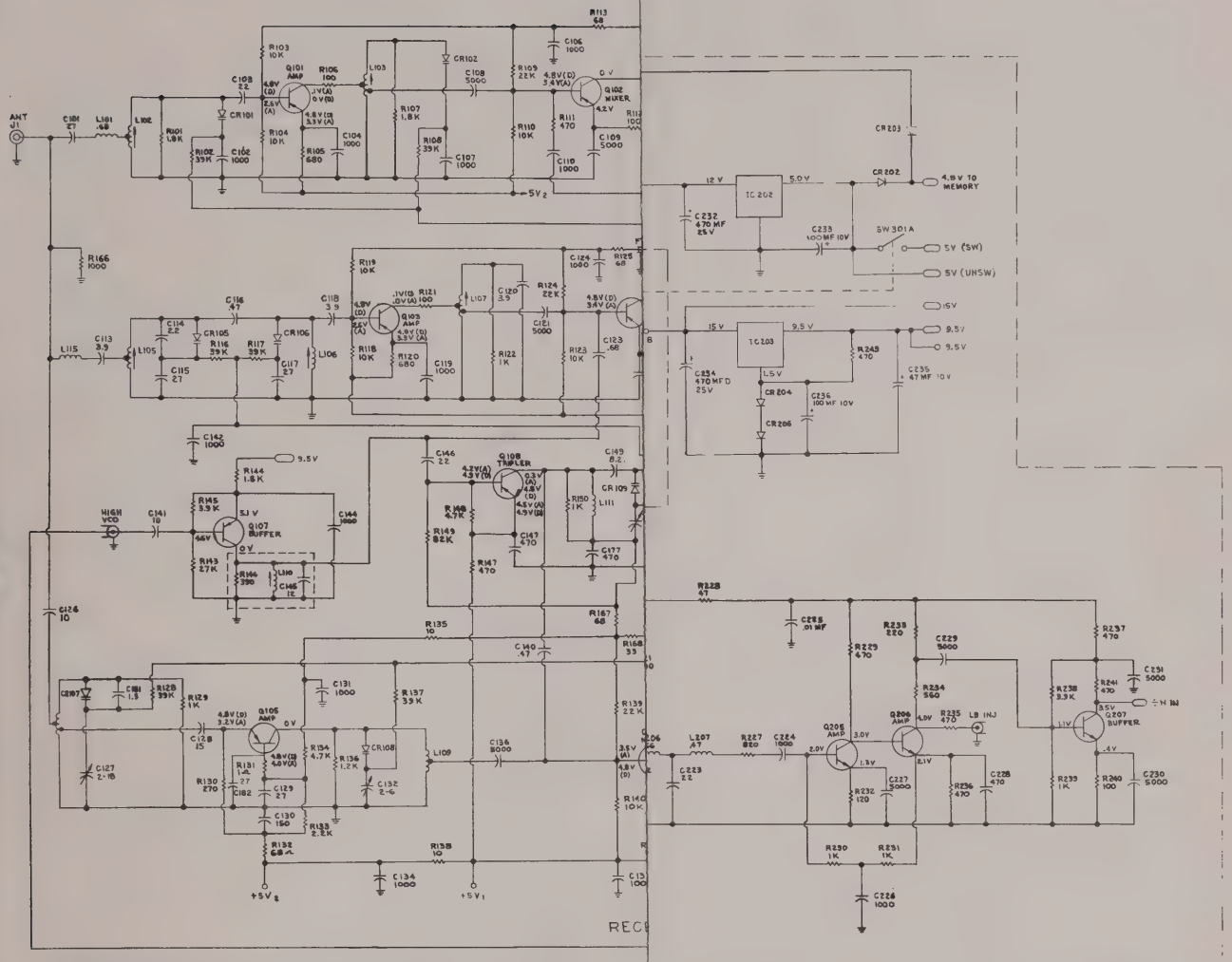


CONTROL BOARD 700-416



KEYBOARD 700-542 B





NOTES

1. ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, UNLESS OTHERWISE SPECIFIED
2. ALL CAPACITOR VALUES ARE IN PICO-FARADS, UNLESS OTHERWISE SPECIFIED.
3. # - MEASURED AT REC FREQ 40.475 MHz.
   (A) - BAND ACTIVATED
   (D) - BAND DEACTIVATED
   (S) - UNIT SQUELCHED
   (U) - UNIT UNSQUELCHED
4. ⬭ TERMINATES OFF BOARD.
   O AND ⟶ TERMINATES ON-BOARD.
5. A EARLY PRODUCTION UNITS:
   E174 = 10K
   C124 = 12 PF
   C128 = 18 PF
   C182 = NOT USED
6. LATER PRODUCTION UNITS:
   E174 = 1.5 K
   C124 = 10 PF
   C128 = 15 PF
   C182 = 47 PF (LOCATED BOTTOM SIDE OF BOARD).

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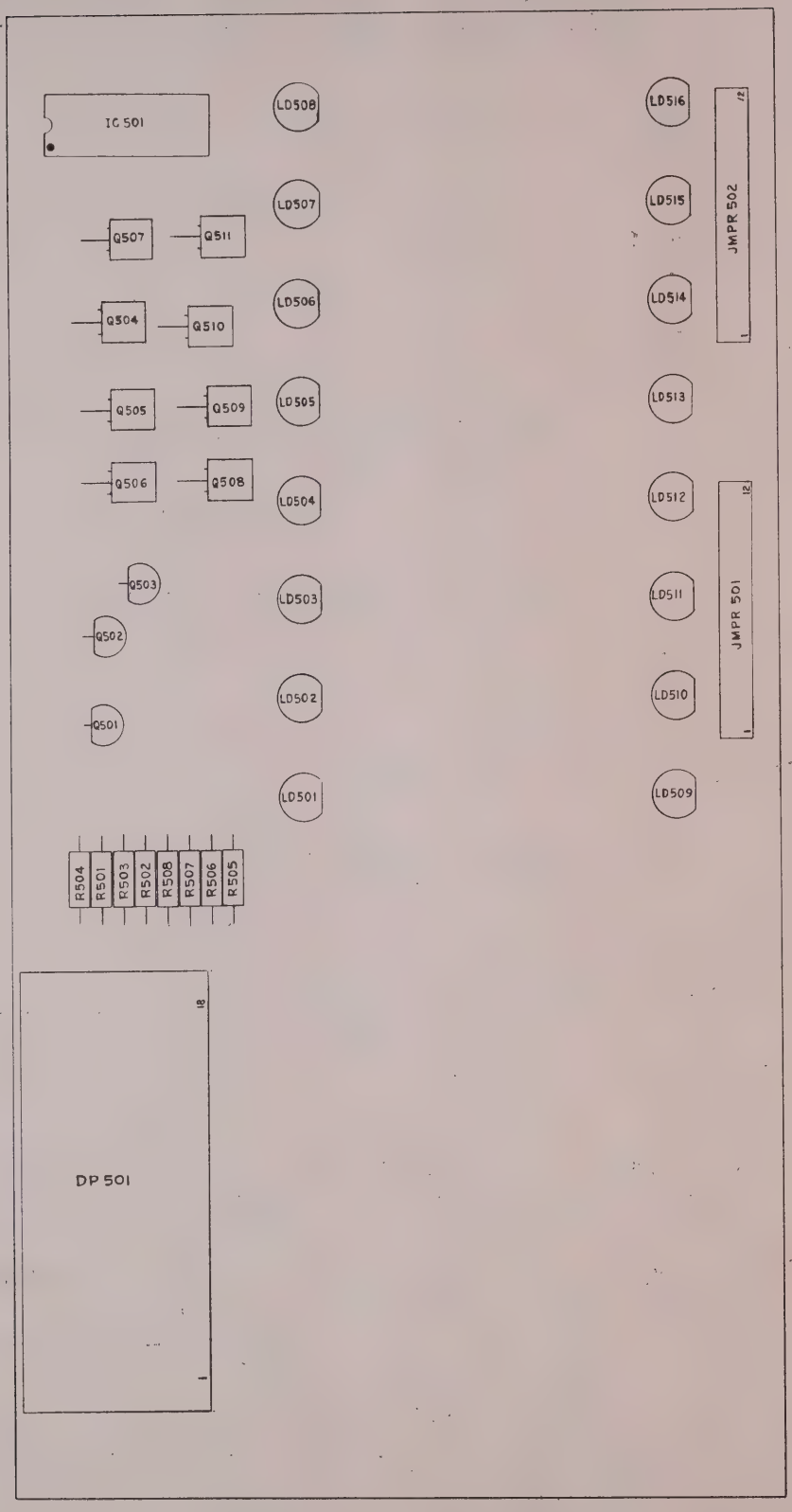
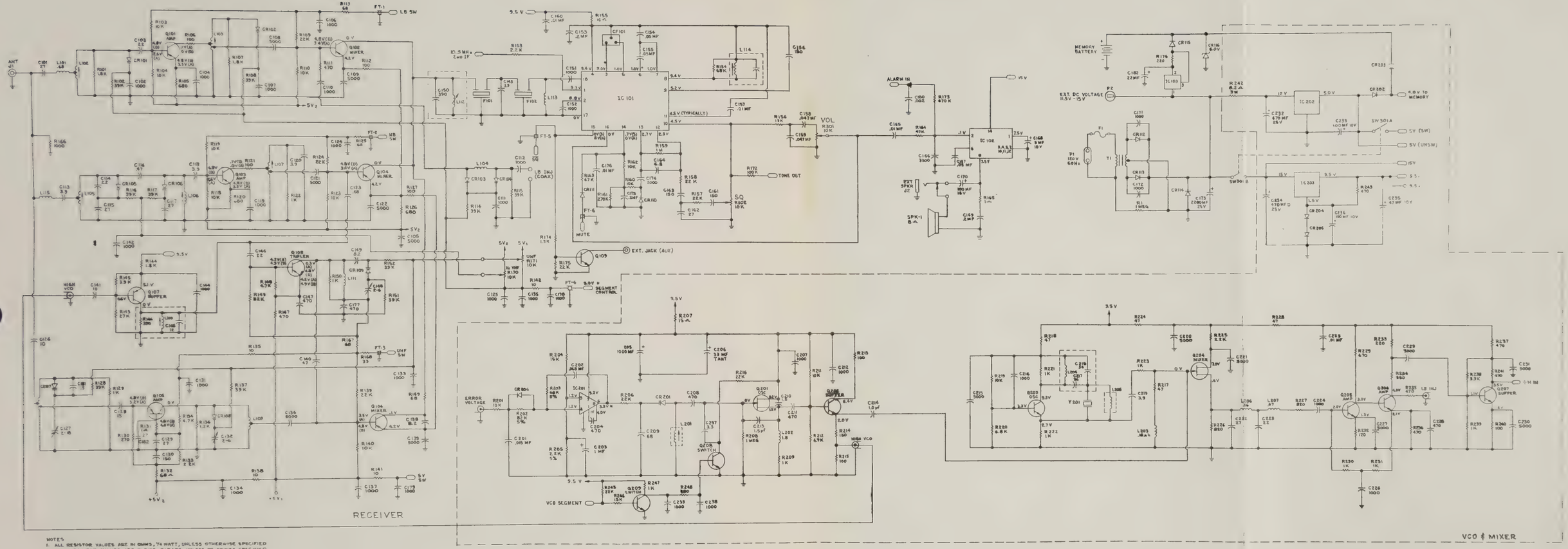
SHEET 1 OF 3

KEYBOARD 700-542 B

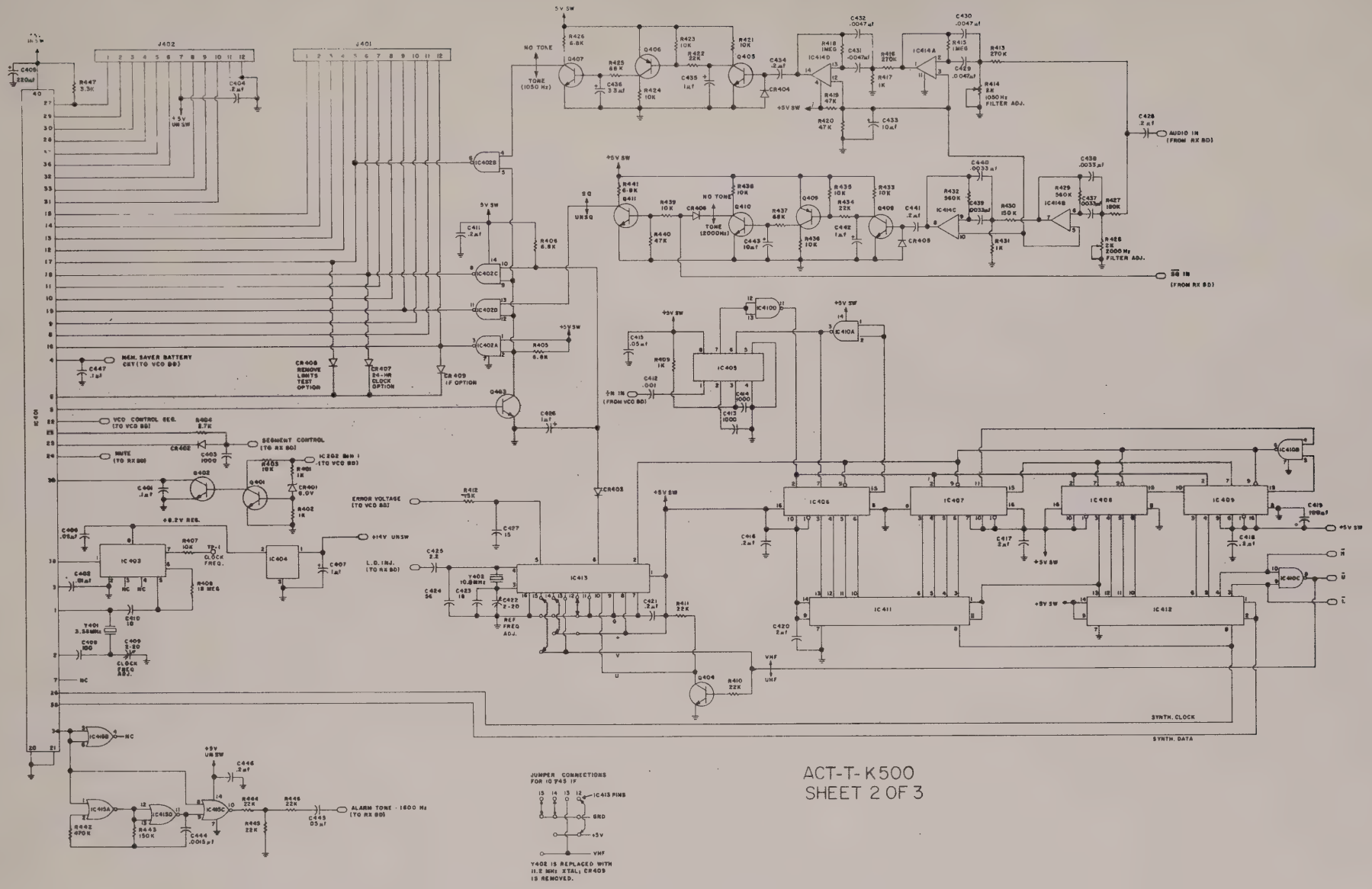




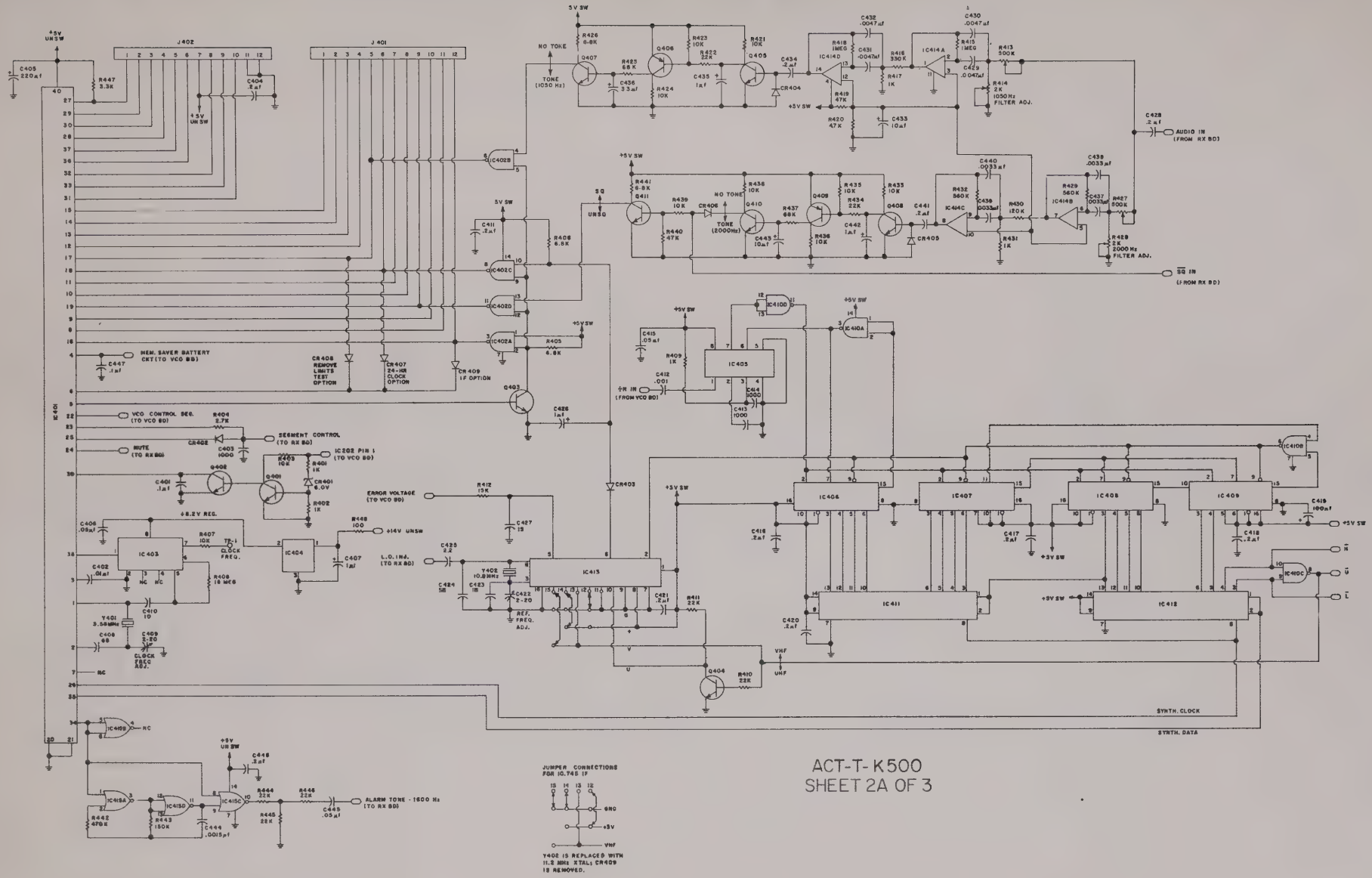
NOTES

1. ALL RESISTOR VALUES ARE IN OHMS, ¼ WATT, UNLESS OTHERWISE SPECIFIED
2. ALL CAPACITOR VALUES ARE IN PICO-FARADS, UNLESS OTHERWISE SPECIFIED
3. ( ) - MEASURED AT REC FREQ 60.475 MHz.
   (A) - BAND ACTIVATED
   (D) - BAND DEACTIVATED
   (S) - UNIT SQUELCHED
   (US) - UNIT UNSQUELCHED
4. ▭ TERMINATES OFF BOARD.
   ○ AND ⟶ TERMINATES ON-BOARD.
5. A EARLY PRODUCTION UNITS.
   R174 = 10K
   C124 = 12 PF
   C128 = 18 PF
   C181 = NOT USED
6. LATER PRODUCTION UNITS
   R174 = 4.5K
   C124 = 10 PF
   C128 = 12 PF
   C181 = 27 PF (LOCATED BOTTOM SIDE OF BOARD).

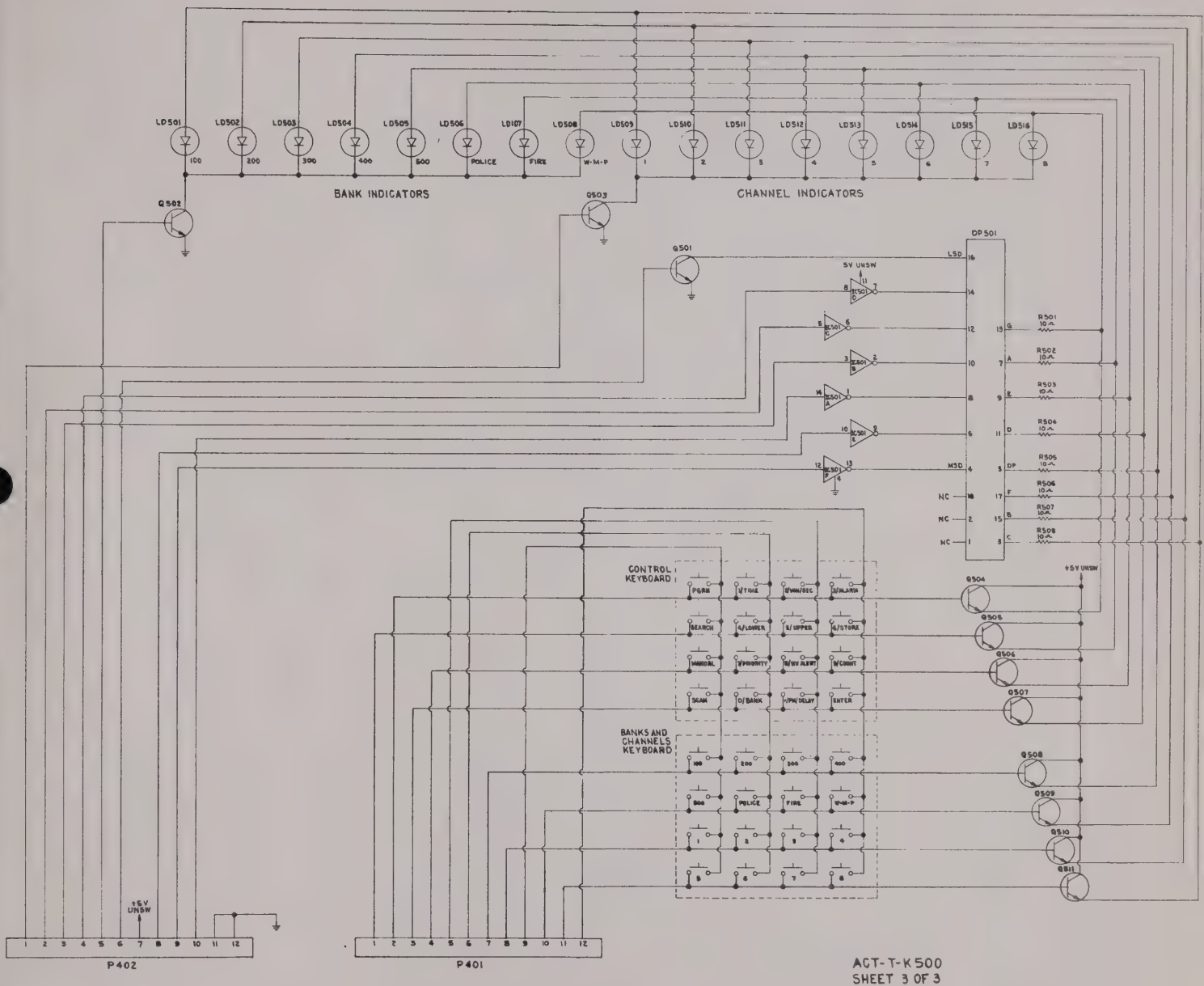
ACT-T-K 500
SHEET 1 OF 3



ACT-T-K500
SHEET 2 OF 3


J402
J401
NO TONE
TONE (1050 Hz)
TONE (2000Hz)
AUDIO IN (FROM RX BD)
SG IN (FROM RX BD)
1050 Hz FILTER ADJ.
2000 Hz FILTER ADJ.
MEM. SAVER BATTERY CKT (TO VCO BD)
CR408 REMOVE LIMITS TEST OPTION
CR407 24-HR CLOCK OPTION
CR409 IF OPTION
VCO CONTROL SEG. (TO VCO BD)
SEGMENT CONTROL (TO RX BD)
MUTE (TO RX BD)
IC202 PIN 1 (TO VCO BD)
8.2V REG.
ERROR VOLTAGE (TO VCO BD)
+14V UNSW
L.D. IN4. (TO RX BD)
CLOCK FREQ.
REF. FREQ. ADJ.
CLOCK FREQ ADJ.
÷N IN (FROM VCO BD)
SYNTH. CLOCK
SYNTH. DATA
ALARM TONE - 1600 Hz (TO RX BD)
JUMPER CONNECTIONS FOR 10.745 IF
Y402 IS REPLACED WITH 11.2 MHz XTAL; CR409 IS REMOVED.

ACT-T-K500
SHEET 2A OF 3



ACT-T-K500
SHEET 3 OF 3

K500 PARTS LIST

RECEIVER BOARD

Item No.	Description	Part No.
	TRANSISTORS	
Q101, Q102, Q103, Q104	PNP	4801-0000-026
Q105, Q106, Q107, Q108, Q109	NPN	4801-0000-016
	INTEGRATED CIRCUITS	
IC101	IF	3130-6056-500
IC102	Audio	3130-3157-614
IC103	5V Regulator	3130-0000-013
	DIODES	
CR101	Varactor	4809-0000-001
CR102	Varactor	4809-0000-001
CR103, CR104	Varactor	4809-0000-008
CR105, CR106, CR107	Varactor	4809-0000-004
CR108, CR109	Silicon	4805-1241-200
CR110, CR111, CR112, CR113, CR114	Silicon, Power	4806-0000-004
CR115	Germanium	4807-1233-900
CR116	Zener, 6V	4808-0000-025
	COILS	
L101	RF Choke	1802-0688-003
L102	Ant, Low Band, (White)	1800-3283-901
L103	RF, Low Band, (White)	1800-3283-902
L104	RF Choke	1803-3268-208
L105	Ant, High Band, Primary, (Brown)	1800-3152-001
L106	Ant, High Band, Secondary, (Red)	1800-3152-002
L107	RF, High Band, (Yellow)	1800-3152-014
L108	Ant, UHF	1800-3255-201
L109	RF, UHF	1800-3160-005
L110	Buffer	1800-3152-009
L111	Tripler, 450 MHz	1800-3160-003
L112	IF, (White)	1800-3191-401
L113	RF Choke	1803-3268-201
L114	Quadrature	1800-6055-801
L115	RF Choke	1803-5125-903

K500 PARTS LIST

RECEIVER BOARD

Item No.	Description	Part No.
	CAPACITORS	
C127	Trimmer, 2.5-20 PF	1517-0000-034
C132, C148	Trimmer, 2-6 PF	1517-0000-035
	RESISTORS	
R170, R171	Variable, 10K	4751-0103-001
	FILTERS	
XF101, XF102	Crystal, 10.345 MHz	2705-3283-600
CF101	Ceramic, 455 KHz	2700-3274-100

LOGIC BOARD

	TRANSISTORS	
Q401, Q402, Q403 Q404, Q405, Q407, Q408, Q410, Q411,	NPN (Black top)	4801-0000-016
Q406, Q409	PNP (White top)	4801-0000-060
	INTEGRATED CIRCUITS	
IC401	Processor	3130-6061-601
IC402	Logic	3130-3157-644
IC403	Logic	3130-3167-915
IC404	Logic	3130-0000-014
IC405	Counter	3130-6071-500
IC405 (alternate part)		3130-6060-604
IC406, IC407, IC408, IC409	Logic	3130-3193-515
IC410	Logic	3130-3157-631
IC411, IC412	Logic	3130-3157-636
IC413	Phase Det	3130-6059-600
IC414	OP AMP	3130-3157-637
IC415	Logic	3130-3157-627

K500 PARTS LIST

LOGIC BOARD

Item No.	Description	Part No.
	DIODES	
CR401	Zener, 6V	4808-0000-025
CR402	Silicon	4805-1241-200
CR403, CR404, CR405, CR406, CR407, CR408, CR409	Germanium	4807-1233-900
	CAPACITORS	
C409, C422	Trimmer, 2.5-20 PF	1517-0000-034
	RESISTORS	
R414, R428	Variable, 2K Ohm	4751-0202-012
	CRYSTALS	
Y401	3.58 MHz	2342-3284-400
Y402	10.8 MHz	2338-3283-202

MIXER/VCO BOARD

	TRANSISTORS	
Q201	FET	4811-0000-020
Q202, Q205, Q206, Q207, Q208	NPN (Red top)	4801-0000-035
Q203	NPN	4801-0000-100
Q204	FET	4811-0000-030
Q209	NPN	4801-0000-016
	INTEGRATED CIRCUITS	
IC201	OP AMP	3130-3167-914
IC202	Regulator, 5V	3130-0000-022
IC203	Regulator, 8V	3130-0000-020

K500 PARTS LIST

MIXER/VCO BOARD

Item No.	Description	Part No.
	DIODES	
CR201	Varactor	4809-0000-004
CR202, CR203	Germanium	4807-1233-900
CR204, CR205	Silicon	4805-1241-200
CR206	Silicon	4805-1241-201
	COILS	
L201	Mix/VCO	1800-3284-300
L202	RF Choke	1803-3268-208
L203	RF Choke	1803-3268-204
L204	Oscillator	1800-3152-002
L205	RF Choke	1803-5125-903
L206	RF Choke	1803-3268-206
L207	RF Choke	1803-3268-207
	CRYSTAL	
Y201	120.91 MHz	2339-3283-100

DISPLAY BOARD

	TRANSISTORS	
Q501	NPN	4801-0000-005
Q502 Thru Q511	NPN	4801-0000-016
	INTEGRATED CIRCUIT	
IC501	Display Driver	3130-3157-630
	DIODES	
LD501 Thru LD516	LED, Red	4810-1282-903
	DISPLAY	
DP501	7 Digit	2000-5141-000

K500 PARTS LIST

DISPLAY BOARD

Item No.	Description	Part No.
	KEYBOARD	
	ACT-TK500	2001-7055-301
	MISCELLANEOUS	
T1	Transformer, Power	5604-5142-400
SPK-1	Speaker, 8 Ohm, 2W	1301-3273-200
	Battery, NI-CAD, 4 Used	4000-3286-300
	Power Cord, AC	6041-3215-900
	Antenna, Telescope	1201-5108-801
	Knob, Vol. and Squelch	2402-5136-600
	Panel, Front	1411-7037-803
	Wrap Assembly	7011-1205-100
	Bumper, Rubber	1401-0000-003